

NOTES ON SOME PLANTS OF PUERTO RICO

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AMONG SOME GENERAL BOTANICAL COLLECTIONS made during the initial stages of a research program on the mossy or elfin forests of eastern Puerto Rico (a forest type found at the summit of several peaks in the Luquillo Mountains) are several plants worthy of special mention or requiring new names to permit their proper use in other publications.

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Cordia wagnerorum sp. nov.

PL. I.

Frutex scandens, ad 4 m. altus; folia lanceolata, irregulariter obtuseque dentata, iridescentia, scabrida cum umbonibus parvis solitariis, umbonibus singulis apice uno pilo brevi rigidoque coronatis; inflorescentia sessilis, axillaris, 3-5-flora; calyx et corolla quadripartita; stamina 3-4; fructus ruber, drupaceus.

A weak shrub with trailing or scrambling branches reaching 4 m. in length. Young stems brown and densely covered with arching, ascending, stiff hairs. Petioles 8-12 mm. long, pubescent with conspicuous appressed ascending hairs and globular glandular hairs. Leaf blades lanceolate, 5.5×2.5 , 8×3 , to 10×3.5 cm. long and wide, apex short and acute, base acute to cuneate, margin undulate in the lower portion, bluntly irregularly dentate in the upper half or two-thirds; primary veins arcuate, ascending, 8-10 pairs, not conspicuously anastomosing; upper surface grayish green and iridescent when fresh, with distinct, isolated umbos each topped with a short, stout, curved and rigid trichome producing a scabrous condition, smaller curved trichomes scattered on the surface or marginal; lower surface lighter in color with abundant glandular exudates when dry. Inflorescence an axillary sessile cluster of 3 to 4 flowers. Calyx ovoid, tube 2.5 mm. long, the lobes 4, greenish white, broadly triangular, 2.5 mm. long, with simple elongate thin-walled hairs and globular resinous hairs; corolla white, the tube 5-7 mm. long, the lobes 4, narrowly triangular, 1-1.5 mm. long, glabrous outside; stamens 3 or rarely 4, attached above the middle of the tube in the few flowers examined, the free portion of the filament 1 mm. long, the attached portion bearing long white-pilose pubescence, anthers oblong, 1 mm. long; ovary ovoid, 2-3 mm. in diameter, glabrous,

the style 2–2.5 mm. long, slightly flattened, glabrous, bifid, each portion divided nearly to the base, the stigmatic areas 1–2 mm. long. Fruit ovoid, 4–6 mm. in diameter, slightly fleshy, red, endocarp warty, style persistent, the persistent calyx surrounding basal portion of fruit; fertile seed unknown.

Puerto Rico. South side of Luquillo Mountains along the El Toro trail 0.5 km. from Route 191. Collected in flower October 4, 1964, *Richard J. Wagner 695* (holotype, A); collected in fruit in November, 1964, *R. A. Howard 15735* (A).

This species was found by Dr. and Mrs. Richard J. Wagner and is named in their honor. It is one of the many botanical collections made by the Wagners which have greatly increased our knowledge of the flora of eastern Puerto Rico.

The closest relative of *Cordia wagnerorum* is *C. bellonis* Urban, a species of the Maricao area of western Puerto Rico. *Cordia bellonis*, described by its recent collectors as a small compact shrub, is smaller in all its parts than *C. wagnerorum* and is distinguished from it by the color of its leaves and the uniform distribution of its dense indument.

In discussing *Cordia bellonis*, Britton noted that it is "a peculiar species, not closely related to the others, perhaps generically distinct" and transferred it to the genus *Varronia*. This species is distinguished partly by its glomerulate axillary inflorescence, a character shared by *Cordia wagnerorum* and not known in other species of Puerto Rico or the West Indies.

Although only a very few plants of *Cordia wagnerorum* have been found in the single location cited, the search continues for additional material. It is hoped that cytological data and additional information about the morphology of the fruit may also be obtained. All fruits examined up to the present contain only a single aborted seed in a single large locule, a condition similar to that noted by Urban in the original description of *Cordia bellonis*. Not one of the few fruits planted germinated; however, a small number of seedlings were found near the type locality of *Cordia wagnerorum*. It should be mentioned that one wall of the endocarp is abnormally thicker than the others which may result from the inclusion of a vascular canal or a reduced cavity representing locules. The characteristics of the fruit and the nature of the inflorescence seem to be significant characters to distinguish the two species discussed here from others assigned to the genus *Cordia*.

***Solanum woodburyi* sp. nov.**

PL. II.

Frutex virgatus, ad 3 m. altus; caules, axes inflorescentiarum, perianthium et folia abaxialiter copiose stellato-pubescentia; inflorescentia cymosa; corolla purpurea; stamina subsessilia, antherae elongatae.

Wand-like shrub to 3 m. tall, stems 1–2 cm. in diameter at breast height, the young stems, petioles, lower leaf surface, the midrib above, inflorescence, and outer surfaces of the perianth densely covered with golden multi-armed, spherical, stellate hair clusters. Petioles 1.5 cm. long, tapering to the base of the blade. Leaf blades oblong to elliptic, 5.5×2.5 to

10 × 4 cm. long and wide, apex obtuse and often short mucronate, base rounded, margin entire, slightly recurved, primary veins 7 pairs, arcuate and conspicuously anastomosing within the margin, upper surface dark green, glabrous except for the depressed midrib which is stellate-pubescent; prickles 8–10 mm. long at maturity, golden, few, mostly 2 at apex of petiole and occasionally 1 or 2 on the midrib near the base of the blade on the lower surface only. Inflorescence axillary, cymose, 2–4 cm. long, usually less than 10-flowered, axes densely stellate-pubescent. Calyx densely stellate, 6 mm. in diameter, shallowly lobed; corolla rich purple when fresh, drying bluish purple or blue, tube 1 mm. long or less, the lobes 5, ovate-lanceolate, to 8 mm. long and 3.5 mm. wide at the base, bluntly acute at the apex, stellate-pubescent outside, glabrous inside; stamens 5, subsessile or the free portion of the filament less than 0.5 mm. long, glabrous, anthers oblong-ovate, broadest at the base but only slightly tapering above, 4.5–5 mm. long, obliquely poricidal and slightly cleft towards the outside at the apex; ovary glabrous, ovoid, 2 mm. in diameter, style terminal, stout, glabrous, 5 mm. long, stigma capitate; fruiting inflorescence erect, stout, berry depressed-globose, green when immature, 2 cm. in diameter and 1.5 cm. long, glabrous.

Puerto Rico. South side of Luquillo Mountains along the El Toro trail 2 kms. from Route 191. Collected in flower and fruit, October 13, 1964, *R. A. Howard & George Taylor* 15692 (holotype A).

This handsome plant is named for Mr. Roy Woodbury who has so generously shared his knowledge of the flora of Puerto Rico. Although Woodbury showed us the small and isolated population of this new species in 1964, an unidentified specimen of it is in the herbarium of the New York Botanical Garden, having been collected by W. R. Barbour along the El Toro trail on March 18, 1935.

This species is clearly distinct from any previously described *Solanum* of the West Indies in its virgate habit, woody structure, density of stellate pubescence, rich purple flowers, and golden prickles.

The type locality of *Solanum woodburyi* has been visited frequently by Woodbury and others yet only one fruit has been found. This fruit is associated with the holotype and, regrettably, it is immature. The lack of fruit suggests some type of developmental anomaly as yet undetermined. Pollen stainability, with cotton blue in lactophenol, was 88.5 per cent based on 614 grains. Meiotic cell division appears normal and Nevling has obtained a chromosome count of $n = 12$ from pollen mother cells of buds collected on April 1, 1965. The voucher specimen for this count is *Howard & Nevling* 15747 (A).

***Psychotria guadalupensis* (DC.) comb. nov.**

Loranthus guadalupensis DC. Prodr. 4: 294. 1830.

Viscoides pendulum Jacq. Select. Amer. 73. t. 51. f. 1. 1763.

Psychotria parasitica Sw. Prodr. 44. 1788; Fl. Ind. Occ. 1: 408. 1797, *nomen illegit.*

- Loranthus portoricensis* DC. Prodr. 4: 293. 1830, not *Psychotria portoricensis* DC. Prodr. 4: 515. 1830.
Uragoga grosourdieana Baill. Adansonia 12: 227, 328. 1876-9; Urb. Engl. Bot. Jahrb. 24: 72. 1898.
Mapouria parasitica K. Sch. in Engler, Pflanzenfam. 4: 112. 1891.
Uragoga parasitica Maza, Anal. Soc. Esp. Nat. II. ser. 3: 293. 1894.
Psychotria pendula Urb. Symb. Antill. 1: 445. 1900, non Hooker, Fl. Brit. Ind. 3: 164. 1880.
Psychotria pendula subsp. *tetrapyrena* Urb. Symb. Antill. 1: 445. 1900.
Psychotria pendula subsp. *grosourdyana* Urb. *ibid.*
Psychotria pendula subsp. *genuina* Urb. *ibid.* 446.
Psychotria pendula subsp. *pachyphylla* Urb. *ibid.* 447.
Psychotria pendula subsp. *grenadensis* Urb. *ibid.*
Psychotria pendula subsp. *trinitensis* Urb. *ibid.*
Psychotria grosourdyana (Baill.) Urb. *op. cit.* 4: 596. 1911.
Psychotria tetrapyrena (Urb.) Urb. *op. cit.* 8: 677. 1921.

This epiphytic but weak shrubby plant assigned to the genus *Psychotria*, *sensu latu*, is common in the Greater Antilles and abundant in the Lesser Antilles. The earliest name applied to the plant is *Viscoides pendulum* Jacquin. In 1788 Olaf Swartz described *Psychotria parasitica* and cited in synonymy *Viscoides pendulum*. The Swartz name, although used in many floras, must be rejected as illegitimate. In 1900 Urban published the name *Psychotria pendula* presumably basing it on the earlier Jacquin epithet (see subsp. *genuina*) but he stated clearly "*non Hook. f. Fl. Brit. Ind. III p. 164*". The name *Psychotria pendula* (Jacq.) Urb. is also widely used in floras of tropical America but it is illegitimate, being a later homonym of the Hooker name *Psychotria pendula* which was applied to a plant from the Andaman Islands.

The earliest name available for this species is *Loranthus guadalupensis* DC. which is based on a Bertero specimen. The type is in the *Prodromus* herbarium in Geneva, Switzerland. The correct name is *Psychotria guadalupensis* (DC.) Howard.

In establishing *Psychotria pendula* Urban noted it was polymorphic and he described six subspecies including a subspecies called *genuina*. These minor taxa are based primarily on differences in leaf size and shape and on the number of pyrenes in each fruit. Three of the subspecies are found on single islands of the West Indies and three on groups of islands. Urban's subsp. *genuina* had a geographic range from Cuba to Grenada. In subsequent issues of his *Symbolae Antillanae* Urban elevated two of the subspecies to specific rank as *Psychotria tetrapyrena* and *P. grosourdyana* without explanation or comment.

I have seen this plant on every island of the West Indies from which Urban recorded it and on a few for which he had no records. There appear to be two growth forms represented by herbarium specimens which can be recognized in the field and which are often closely associated. The plants may have stout upright branches in their epiphytic habitat and

leaves with thick blades and short petioles. Other plants have a few to all branches weak and drooping, tending to be thinner and more delicate and leaves thinner in texture with narrowed bases and more elongate petioles. It is difficult to conclude that two species would be growing in such close proximity often intermingled in the crotch of a single tree, yet it is impossible to be certain that only one plant is involved in many such collections. The variation in leaf thickness is great in fresh condition and is often accentuated in drying. The thicker leaves tend to dry more slowly and therefore turn dark brown or black in the process.

Variation in peduncle color is mentioned by Urban as an accessory characteristic. In living specimens seen in the field this color varies from deep red through bright red to pale green. A collection from the summit of Cerro de la Punta in the center of Puerto Rico (*Howard & Nevling 15417*) has peduncles clear white in color. This albino phase is the extreme variation.

Urban places undue emphasis on the number of pyrenes produced by these plants, culminating in the recognition of *Psychotria tetrapyrena*, having four pyrenes. An examination of herbarium specimens from throughout the range revealed quite unexpectedly that these plants are heterostylous, a fact not previously reported for the species. Further, the pollen proved to be of three types which will be described in a later paper. There was a correlation between the number of stigma lobes and the number of locules in the ovary; however, a variation was noted in the number of sepals. Recently it has been possible to examine a large number of plants in Puerto Rico, for the species is common in the Luquillo Mountains, occurring in wet but open forests and in the mossy or elfin forest zone. One flower was taken from each plant, and the number of sepals and stigmas recorded. In the following tabulation the first number is of calyx points (sepals); the second, the number of stigma lobes; and the third, the number of examples seen.

7-3-1	5-3-41
6-4-2	5-2-9
6-3-3	4-4-2
6-2-1	4-3-6
5-4-7	4-2-2

Britton and Wilson (*Flora Puerto Rico and Virgin Islands* 6: 244. 1925) use the name *Psychotria grosourdyana* for this plant saying it is "parasitic on forest trees" and describe it as having a fruit containing "3 pyrenes." In an actual check of the mature fruit the calyx of the soft black multistoned drupe was examined and then the drupe squashed between fingers to separate and count the number of fertile (the hard brown) pyrenes. White pyrenes were regarded as sterile since they did not contain seeds. Again, using one mature fruit from each plant the following count was obtained representing, respectively, number of calyx lobes, number of

pyrenes, the number of mature and fertile pyrenes, and the number of examples seen.

6-4-4-1	5-4-3-2	5-2-1-1
6-4-3-3	5-4-2-2	4-4-2-1
6-3-3-1	5-3-3-14	4-3-3-2
6-3-1-1	5-3-2-19	4-3-2-1
	5-3-1-15	
	5-3-0-2	

It is clear from this tabulation of plants growing in eastern Puerto Rico that the variation in number of pyrenes removes any value the character might have for purposes of classification.

Representative recent collections of *Psychotria guadalupensis* (DC.) Howard from eastern Puerto Rico are *Wagner 81*, *Howard & Nevling 15749* and *15963*, all of which have been distributed widely to major herbaria.

Curculigo capitulata (Lour.) O. Ktze. Rev. Gen. Pl. 2: 703. 1891.

Leucojum capitulatum Loureiro, Fl. Cochinchin. 199. 1790.

Curculigo recurvata [Dryander in] Aiton, Hort. Kew. ed. 2. 2: 253. 1811.

Molineria recurvata Herbert, Amaryll. 84. 1837; Brackett, Rhodora 25: 161. 1923.

Molineria hortensis Britton in Fl. Puerto Rico and Virgin Islands 5: 161. 1924.

Britton described *Molineria hortensis* as a new species similar to *Molineria recurvata* and based it on a specimen cultivated in a garden near La Muda. The collection, *Britton 7892*, is preserved at the New York Botanical Garden. It was collected in flowering condition in March, 1923. Britton stated the species was cultivated in "Porto Rico gardens" and that its origin was unknown but it probably came from tropical India or Malaya. In the New York Botanical Garden herbarium there is also an older specimen collected by *J. A. Stevenson* (1891) at Rio Piedras (Agricultural Experiment Station) on April 30, 1914. A hand written annotation label by N. E. Brown is attached to this sheet and states "Curculigo sp. (not *C. recurvata*). I have looked through the whole of the Kew material twice and through the collection of drawings and cannot match this with anything." This annotation appears to be the sole basis for Britton's conclusion that the plant represented a new species. The published description in no way differs from one of "*Curculigo recurvata*."

Regrettably, the illustrations which have been published and were available at the time of Brown's search vary greatly in their accuracy and a comparison of Stevenson's specimen or that collected by Britton with certain illustrations could easily lead to the conclusion drawn. Today even the status of the genus *Molineria* is uncertain. It was recognized by Herbert and by Baker, early authorities on the Amaryllidaceae, and by Pax and Hoffman in their treatment of the family for *Die Pflanzenfamilien*

(ed. 2). More recently Brackett indicated *Molineria* as a distinct genus and so did Neal in her book, *In Hawaiian Gardens*, published in 1965. By contrast most recent floras, horticultural encyclopedias and taxonomic works place *Molineria* in the synonymy of *Curculigo*.

In describing the genus *Molineria* Colla (Hortus Ripulensis, Append. 2. 331. t. 18. 1825) noted that the anthers in the species he considered were fused. Later Herbert (Amaryll. 84. 1837) questioned the monadelphous character of the anthers and, surprisingly, this condition has not been further discussed in any recent study yet encountered. The several authors who have accepted *Molineria* as distinct from *Curculigo* all adopt different characteristics as generically significant and a further study of the broad-leaved and petioled species is needed.

If the fusion of the anthers is a character of generic value in the Amaryllidaceae, and it may be in related families, then the material Britton described is properly placed in *Molineria*. The collection, *Britton* 7892, does have the anthers fused. Collections made in the Luquillo Mountains by Dr. and Mrs. Wagner, e.g. 486, 567, also have fused anthers and the consistency of this character has been checked with an abundance of living materials from this population. No mention is made of the fusion of anthers in the description of *Curculigo recurvata* (by Dryander in Hortus Kewensis), although the character is clearly shown and is mentioned in Edwards *Botanical Register* (9: pl. 770. 1823) where the description is credited to Roxburgh "Mss." Merrill appears to be the first to accept the application of the Loureiro name to this complex and has repeated the synonymy given above. The syngenesious character is not mentioned by Loureiro in his description of the basionym *Leucojum capitulatum*, yet if *Molineria* is to be recognized as the proper genus a new combination is needed for the specific name. In any case *Molineria hortensis* Britton is not a new species but a synonym of *Curculigo capitulata* (Lour.) Ktze. as currently accepted.

***Conostegia hotteana* Urban & Ekman Ark. Bot. 22A. 17: 29. 1928.**

A single plant identified as this species and verified by Dr. John Wurdack was collected by Dr. and Mrs. Wagner, numbers 678 and 843. It was growing at km. 21.3 on route 191 on the south side of the Luquillo Experimental Forest. The plant is a small tree, 5 meters tall with a trunk diameter of 15 cm. at breast height. The flowers are 2.5 cm. in diameter and the white petals are characteristically broadly cuneate.

As the specific name indicates, *Conostegia hotteana* was described from material collected July 12, 1928, by Erik Ekman, between Dame-Marie and Montagnac in the Massif de la Hotte in Haiti. The exact location is at the extreme western end of the southern peninsula of Hispaniola. The present collection is not only the first record of the species since the original collection but also the first record of the genus in Puerto Rico. These disjunct localities are not represented in any other genus or species occurring in either Puerto Rico or Haiti. Although the Puerto Rican plant

is but a few yards from the roadside, on the steep slopes of a river bank and within an experimental forest it is not a planted specimen. There is neither a reason nor a record of the deliberate introduction of this non-economic plant to Puerto Rico. The location of the original collection in Haiti is not one commonly visited by tourists and so does not suggest a chance introduction. The occurrence of this species in Puerto Rico and in Haiti defies immediate explanation.

EXPLANATION OF PLATES

PLATE I

Cordia wagnerorum Howard. FIGS. a-e from *Wagner 695* (holotype); FIG. e from *Howard 15735*. a, habit, $\times 1/2$; b, portion of upper leaf surface, showing umbo, $\times 50$; c, seedling, $\times 1/4$; d, external view of flower, $\times 4$; e, longitudinal section of flower, $\times 4$; f, fruit, $\times 5$.

PLATE II

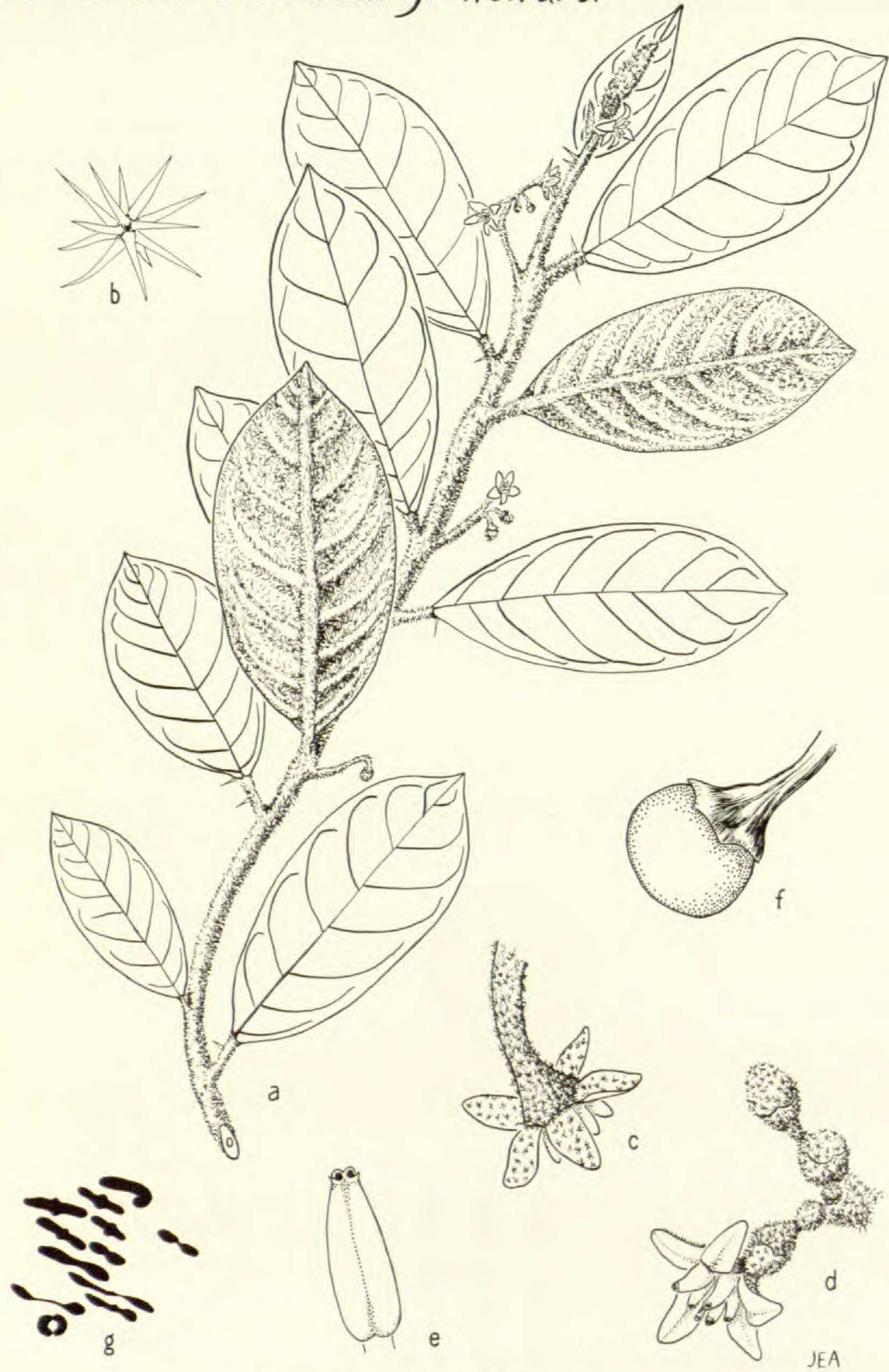
Solanum woodburyi Howard. All FIGS. from *Howard & Taylor 15692* (holotype). a, habit, $\times 1/2$; b, trichome showing stellate character, $\times 20$; c, external view of flower, $\times 2$; d, portion of inflorescence showing buds and mature flower, $\times 2$; e, anther, $\times 5$; f, immature fruit, $\times 1$; g, chromosomes at first meiotic division, $n = 12$.

Cordia Wagnerorum Howard



JEA

Solanum Woodburyi Howard



HOWARD, PLANTS OF PUERTO RICO